UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/869,293	08/27/2001	Kouji Yoshida		3989

22850 7590 08/31/2005

OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
SETH, MANAV	

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 08/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/869,293	YOSHIDA, KOUJI	
	Examiner	Art Unit	
	Manav Seth	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 April 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5-8 and 11-34* is/are pending in the application.

4a) Of the above claim(s) *12-34* is/are withdrawn from consideration.

5)☒ Claim(s) *1-4,9-10* is/are allowed.

6)☒ Claim(s) *5,11* is/are rejected.

7)☒ Claim(s) *6-8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to the Lack of Unity/ Restriction Requirement

1. The response to the lack of unity/restriction requirement filed on 18 April 2005 has been entered in full. Applicant's arguments with respect to the lack of unity/restriction requirement have been considered but they are not persuasive. As discussed in the previous office action regarding the lack of unity/restriction requirement/election mailed on 18 March 2005, the application contains four different groups of invention, which are not linked as to form a single general inventive concept under PCT Rule 13.1. Therefore, keeping in view of the serious burden in search and examination of the entire application, examiner selects Group I, claims 1-11, provisionally selected by the applicant, for examination and all other claims, claims 12-34, are withdrawn from examination. This lack of unity/restriction is made final.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Su et al., U.S. Patent No. 6,608,920, and further in view of Chau et al., U.S. Patent No. 5,859,698.

Regarding claims 5 and 11, Su discloses step of performing template matching between the registered (reference) template and a newly measured waveform (image) (col. 2, lines 40). Su further teaches continuously updating (replacing) the registered (reference) image template with the new signal waveform (image) (col. 3, lines 1-6) and since the process is continuous, the above steps are repeated and further support can be found in (col. 2, lines 40). Su does not clearly provides the teachings where a new waveform template (reference image) is generated based on the plurality of the waveforms (images). However, generating a reference image using a plurality of images is very well known in the art and this well known technique is further supported by Chau. Chau discloses automated image processing techniques in which a computer based processing system is first trained using a reference (registered) image, to create an edge enhanced reference (registered) template (col. 2, lines 28-32). Chau further disclose the generation of the reference (registered) template based on the plurality of images (figure 1; col. 4, lines 1-30). Chau discloses performing template matching between the reference (registered) template and a newly measured waveform (image signal) (col. 4, lines 42-54). Therefore, it would have been obvious for one of ordinary skill in the art at the time of invention was made to use Chau's teachings of generating a reference image (template) based on the plurality of images (waveforms) in the invention of Su because both prior art references provides the teachings of being used in the same field of photolithography inspection of the wafers (See Su: col. 1, lines 1-15 and see Chau: col. 7, lines 54-56) and Chau further teaches that the use of multiple images to form a reference template would reduce the possible number of false signals (col. 4, lines 22-30).

Allowable Subject Matter

Reasons of Allowance:

4. Claims 1-4 and 9-10 are allowed.

The following is an examiner's statement of reasons of allowance:

The instant invention is directed to a template matching method for performing template matching on a waveform of a signal (image signal), a value of the signal varying according to at least a parameter which further includes estimating an occurrence probability distribution of signal values based on the plurality of measured signal waveforms and further generates (a) a waveform template including an expected value of signal value at each value of the parameter and (b) a probability template and then performs template matching between newly measured signal waveform and the waveform template (generated in step 2) by using the piece of occurrence probability information of each of expected values. The closest prior art (Peppers et al., U.S. Patent No. 5,016,981) teaches optical pattern matching between the input image and reference patterns where each projection data is determined according to the probability distribution. The closest prior and the prior art of record does not teach the limitation: generating (a) a waveform template including an expected value of signal value at each value of the parameter and (b) a probability template and then performs template matching between newly measured signal waveform and the waveform template (generated in step 2) by using the piece of occurrence probability information of each of expected values as recited in claims 1 and 9. Therefore claims 1 and 9 are allowed. All other claims dependent on claims 1 and 9 are allowed at least by dependency on claims 1 and 9.

5. Claims 6-8 are objected to as being dependent upon a rejected base claim 5, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Similar reasons of allowance apply to claims 6-8 as applied to claims 1 and 9.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Peppers et al., U.S. Patent No. 5,016,981, discloses a mask capable of causing a photosensor to detect information represented by a signal from the mak with high probability.
- Okuba, U.S. Patent No. 4,461,028, discloses a method and apparatus for identifying seal stamp based on pattern matching..
- Ozaki et al., U.S. Patent No. 5,568,564, discloses a image processing apparatus and method for inspecting defects of enclosures of semiconductor devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manav Seth whose telephone number is (571) 272-7456. The examiner can normally be reached on Monday to Friday from 8:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Manav Seth
Art Unit 2625
August 24, 2005

BHAVESH M. MEHTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600